WHAT IS CLAIMED IS:

(1) In a fuel assembly having an upper tie plate, a lower tie plate, a plurality of fuel rods of which the upper ends are held by said upper tie plate, of which the lower ends are held by a fuel rod holding portion of said lower tie plate, and which are each filled with a plurality of fuel pellets, and water rods that are arranged among said fuel rods, the improvement which comprises:

a resistance member provided at the lower end portion of said fuel assembly;

a coolant ascending path in which said water rods have coolant inlet ports that are open in a region lower than said resistance member; and

a coolant descending path which is communicated with said coolant ascending path and which has a coolant delivery port that is open in a region higher than said resistance member, in order to guide the coolant downwardly which is opposite to the direction in which said coolant flows in said coolant ascending path.

(2) A fuel assembly according to claim 1, wherein said resistance member is said fuel rod holding portion of said lower tie plate.

(3) A fuel assembly according to claim 1, wherein said resistance member is the one that is arranged under said fuel holding portion of said tie plate and that is mounted on said lower tie plate.

(4) A fuel assembly according to claim 37, wherein said coolant ascending path extends beyond the upper end of the fuel pellet-filled region of said fuel assembly.

(5) A fuel assembly according to claim 37, wherein the upper end of said coolant ascending path is

located at a position lower than the upper end of said fuel pellet-filled region.

(6) A fuel assembly according to claim 4, wherein said coolant delivery port is positioned near the lower end of said fuel pellet-filled region.

(7) A fuel assembly according to claim 1, wherein said coolant descending path surrounds said coolant ascending path.

(8) A fuel assembly according to claim 1, wherein the sectional area of said coolant ascending path changes in the axial direction thereof.

(9) A fuel assembly according to claim 8, wherein said coolant ascending path has a sectional area that is wider in the upper portion thereof than a sectional area in the lower portion thereof.

(10) In a fuel assembly which is to be loaded in the reactor core of a boiling-water reactor having an upper tie plate, a lower tie plate, a plurality of fuel rods of which the upper ends are held by said upper tie plate, of which the lower ends are held by a fuel rod holding portion of said lower tie plate, and which are each filled with a plurality of fuel pellets, and water rods that are arranged amogn said fuel rods, the improvement which comprises:

a resistance member provided at the lower end portion of said fuel assembly;

a coolant ascending path in which said water rods have coolant inlet ports that are open in a region lower than said resistance member, and in which the flow path area increases as it goes upwards; and

a coolant descending path which is communicated with said coolant ascending path and which has a coolant delivery port that is open in a region higher than said resistance member, in order to guide the

coolant downwardly which is opposite to the direction in which said coolant flows in said coolant ascending path;

and wherein an average enrichment in the upper portion of said fuel assembly is set to be greater than that of the lower portion.

(11) A fuel assembly according to claim 10, wherein said resistance member is said fuel rod holding portion of said lower tie plate.

(12) A fuel assembly according to claim 10, wherein said resistance member is arranged under said fuel rod holding portion of said tie plate and is mounted on said lower tie plate.

(13) A fuel assembly according to claim 10, wherein said coolant ascending path extends beyond the upper end of said fuel pellet-filled region.

(14) A fuel assembly according to claim 10, wherein the fuel pellet-filled region of said fuel assembly is divided into two regions in the axial direction thereof, an average enrichment of the upper region is set to be greater than that of the lower region, and the boundary between said upper region and said lower region is selected to lie within a range of from 1/3 to 7/12 of the total length of said fuel pellets in the axial direction from the lower end of said fuel pellet-filled region.

(15) A fuel assembly according to claim 10, wherein the flow path area of said coolant ascending path is greater in the upper portion of said coolant ascending path than that of the lower portion of said coolant ascending path.

(16) In a fuel assembly having an upper tie plate, a lower tie plate, a plurality of fuel rods of which the upper ends are held by said upper tie plate, and of which the lower ends are held by a fuel rod holding

portion of said lower tie plate, and which are each filled with a plurality of fuel pellets, and water rods that are arranged among said fuel rods, the improvement which comprises:

a resistance device that is mounted on said lower tie plate at a position lower than said fuel rod holding portion of said lower tie plate;

a coolant ascending path in which said water rods penetrate through said fuel rod holding portion and have coolant inlet ports that are open in a region lower than said resistance member; and

a coolant descending path which is communicated with said coolant ascending path and which has a coolant delivery port that is open in a region higher than said resistance member, in order to quide the coolant downwardly which is opposite to the direction in which said coolant flows in said coolant ascending path;

and wherein said resistance device has a plurality of coolant paths each having a throat portion, sectional area of each of said coolant paths increases continuously toward the upstream side and the downstream side starting from said throat portion, and the opposing side walls of each of said coolant paths are constituted by continuous surfaces without corners from the upstream side through said throat portion up to the downstream side.

(17) A fuel assembly according to claim 16, wherein said resistance device has a plurality of resistance members, said coolant paths are formed among said resistance members, and the opposing side walls of said coolant paths are constituted by the surfaces of said resistance members.

(18) A fuel assembly according to claim 16, wherein said resistance members provided in said resistance device consist of round rods.

(19) A fuel assembly according to claim 16, wherein said coolant delivery port of said coolant descending path is opened in a region higher than said fuel rod holding portion.

(20) A fuel assembly according to claim 16, wherein said coolant descending path penetrates through said fuel rod holding portion, and said coolant delivery port is opened between said fuel rod holding portion and said resistance device.

(21) A fuel assembly according to claim 16, wherein said coolant ascending path extends beyond the upper end of the fuel pellet-filled region of said fuel assembly.

(22) A fuel assembly according to claim 16, wherein said coolant descending path surrounds said coolant ascending path.

(23) A nuclear reactor having a reactor vessel and a plurality of fuel assemblies loaded in the reactor core in said reactor vessel, wherein each of said fuel assemblies comprises:

an upper tie plate;

a lower tie plate;

a plurality of fuel rods of which the upper ends are held by said upper tie plate, of which the lower ends are held by a fuel rod holding portion of said lower tie plate, and which are each filled with a plurality of fuel pellets;

water rods arranged among said fuel rods;

a resistance member provided at the lower end of said fuel assembly;

means for controlling the amounts of voids accumulated in said water rods;

a coolant ascending path in which said water rods have coolant inlet ports that are open in a region lower than said resistance member; and

a coolant descending path which is communicated with said coolant ascending path, and which has a coolant delivery port that is open in a region higher than said resistance member, in order to guide the coolant downwardly which is opposite to the direction in which the coolant flows in said coolant ascending path.